

Richardson (Jos. G.)

NEW METHOD
OF
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AND
CERTAIN URINARY DEPOSITS
DURING TRANSPORTATION.

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BY JOSEPH G. RICHARDSON, M.D.,
Lecturer on Morbid Anatomy in the University of Pennsylvania; Physi-
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the Pennsylvania Hospital, etc.

*Read before the Biological and Microscopical Section of the Academy of
Natural Sciences, and recommended for publication in the Phila-
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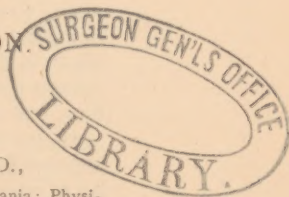
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NEW METHOD OF PRESERVING TUMORS AND CERTAIN URINARY DEPOSITS DURING TRANSPORTATION.

IN the early days of medical microscopy, partly because all revelations of the science were looked upon by most practitioners with suspicion or positive distrust, partly, I presume, on account of real unskilfulness among its students, microscopic examinations were rarely called for, and there was little need of devising plans for securing the portability of specimens. At present, however, when the value of the microscope, not merely as an aid, but even as the most reliable guide for diagnosis, prognosis, and treatment, in many forms of disease, is becoming almost universally recognized, some means of transporting urinary and other deposits, tumors, etc., over long distances, in the unaltered condition, has become a great desideratum. As a contribution towards this important object, I offer to the profession the subjoined method, originally contrived to meet the exigencies of a recent case in my own practice.

The clinical history in this particular instance, being accurately noted by the patient himself, a highly intelligent physician, gives such an exquisite picture of one form of the special renal malady in question, that I am confident most of my auditors will feel some interest in its relation, which is briefly as follows:—

About the 20th of August last, I received a letter

from Dr. —, residing in one of the trans-Mississippi States, informing me that he had forwarded to my address two specimens of deposit let fall from samples of his own urine, which he wished me to examine. In speaking of his condition, he remarked,—

“ I am forty years of age, and for the last four years my health and strength have been steadily failing. From my normal weight of 165 pounds, I have declined gradually to 132, at the rate of about eight pounds per annum. My condition at first was attributed to malarial fever, but this cause has not involved the case for more than two years. My symptoms have, during this time, been as follows: great general debility, more or less dyspeptic symptoms, aggravation of rheumatic stiffness and soreness (not pain), from which I have suffered for years. A constant tendency to lose the erect position, and droop in the neck and shoulders. A gradual impairment of virility, amounting for the last six months almost to extinction. In fact, to sum up all in a word, general debility without apparent cause covers the case. I have run the gamut, under the ablest advice, of tonics, stimulants, and nutritious diet, and have taken a sea-voyage of three months' duration, with no appreciable benefit. A few months ago I accidentally discovered—what had never before been suspected—the presence in my urine of albumen in large amount. Its presence is persistent, and its quantity on the increase. The deposit after being precipitated, and allowed twelve hours to settle, just half fills the tube. I have never had any sign of dropsical effusion, but for the last year or more have suffered from periodical attacks of almost uncontrollable diarrhoea, developing themselves with much regularity about every two months, and lasting from three days to as many weeks. The amount of urine secreted is about thirty-two ounces for twenty-four hours, variable in color, but never turbid when fresh. I micturate a little oftener than when in health, always having to rise at least once during the night; urine much inclined to foam, sp. gr. normal (1021). Prof. —, of Philadelphia, has pronounced my liver, spleen, and heart healthy, while my vital ca-

capacity as indicated by the spirometer is fifteen per cent. above par. . . . May I trespass upon your professional courtesy so far as to ask you to solve the problem, in which I am so much interested, by a microscopic examination? The presence of casts will of course demonstrate renal degeneration; but suppose no casts are found, what then? How in that case would my malady be termed? Certain it is I am suffering from something which, unarrested, must hurry me to a goal not dim or far distant. Please give me your views in reference to diagnosis, prognosis, and treatment. . . . Soliciting an early reply as the greatest favor that could be rendered to one in my present condition of suspense,—it is the *suspense alone* that tries me,—I subscribe myself, etc."

This letter—which, I should mention, Dr. — with brave unselfishness, and in the spirit of a true philanthropist, has most generously given me permission to make free use of in preparing any paper upon the subject—was accompanied by a small box, enclosing the two samples of urinary deposit. Each specimen was contained in an ordinary two-drachm vial, stopped with a cork that previous to its insertion into the mouth of the bottle had been wrapped in a piece of thin India rubber, and then, being pressed in to the level of the lip, had been firmly tied down with another small circle of sheet caoutchouc. The ingenious precautions thus employed to prevent leakage were entirely successful, but the long journey of some twelve hundred miles, occupying more than a week of the hot weather with which we were visited during the past summer, had given time enough for complete decomposition to occur, and, although one of the specimens was prepared with a small portion of carbolic acid solution, entire putrefaction had taken place in both before their arrival. The vial which had been merely sealed up gave forth when uncorked a strongly ammoniacal odor, and its deposit was composed

only of amorphous granular matter. The other specimen, to which carbolic acid had been added, contained an abundant white coagulum, without any tube-casts, epithelial cells, or leucocytes. Numerous mycelial threads of fungous vegetation presented themselves, and were probably capable of developing in the solution to which carbolic acid had been added, because that acid was deprived of its parasiticial properties when it combined with the albumen of the urine.

On mentally reviewing the preservative agents at our disposal, and rejecting, of course, alcoholic and arsenical fluids, on account of their power of coagulating albuminous substances, it occurred to me that solution of acetate of potash, whose admirable properties as a preservative menstruum for microscopic objects formed the subject of one of my communications to this Section last year, would best serve our purpose; and I therefore wrote to my correspondent, informing him of the ill success of his first venture, and requesting him to prepare another specimen by filling a similar small vial with dry acetate of potash and then pouring in a fluid drachm of the sediment let fall from his morning urine after standing twelve hours in a cool place.

On the 12th of September I again received two samples, one of which had been mixed with the washings of a bottle that had formerly contained acetate of potash, and which comprised the doctor's entire stock of the salt; the other prepared with a small portion—about twenty drops—of alcohol. Both of these were worthless for microscopic examination; and I therefore procured a two-drachm vial of solid acetate of potash and forwarded it to my patient by return mail, requesting him as before to add to its contents a fluid drachm of his urinary deposit.

This last experiment in the preservation of a

urinary sediment for transportation, the fifth of the series it completed, was entirely successful, the preparation reaching me about the 1st of October, not only in such a condition as to show well-defined hyaline, granular, and fatty epithelial casts of the uriniferous tubules in great abundance, but likewise embalming, so to speak, those pathognomonic signs of Bright's disease so perfectly that a drop of the fluid, which I have placed beneath one of the Academy's microscopes this evening, exhibits numerous tube-casts with admirable distinctness, even although more than six weeks have now elapsed since this identical sample which I here hold in my hand was prepared for examination, upwards of twelve hundred miles away.

During the past few years I have repeatedly felt the need of some method for preserving specimens of tumors and other pathological formations for microscopic investigation, which might prevent the alterations in the cellular elements which are so apt to occur with the media now in use, and also avoid the difficulty of sending fluids by mail, or the delay and expense attendant upon carriage by express. Since employing the plan described above, for insuring the portability of specimens of tube-casts, in spite of their exposure to either very high or very low climatic temperatures, I have made a few observations upon the effects of the acetate of potash solution upon morbid growths, and, as a result of my researches, recommend the following method.

Place a small fragment of any tumor or pathological structure, say a quarter to half an inch square and one-tenth of an inch thick, in a couple of drachms of saturated solution of acetate of potash, and allow it to fully imbibe the fluid by soaking therein for forty-eight hours. The solution referred to is best made by simply pouring half

an ounce of rain-water upon one ounce of dry granular acetate of potash, in a clean bottle. When the tissue is thus fully saturated with this saline liquid, remove it by means of a pair of forceps, without much pressure, and insert it in a short piece of India rubber tubing, or wrap it up carefully in a number of folds of thin sheet rubber or of oiled silk, tying the whole firmly at the ends with strong thread. When thus prepared, specimens can be enclosed with a letter in an ordinary envelope, and sent long distances, doubtless thousands of miles, by mail, without danger, on the one hand, of decomposition, because of the preservative power of the potassic acetate, or, on the other, of desiccation, on account of its exceedingly deliquescent nature.

One very important advantage which this plan has over those in which alcohol or glycerin is employed as a preservative agent, is that the menstruum has little or no effect upon the oil-globules contained in cells. Hence by its aid we are enabled to recognize fatty degeneration in the cellular elements of a tumor, and easily to detect the same metamorphosis in the kidneys from minute oil-drops in the epithelium attached to tube-casts of Bright's disease, under circumstances where specimens preserved in glycerin or alcohol would afford a doubtful or wholly negative result.

Urinary deposits composed of oxalate of lime or of triple phosphate are not, according to my experience, readily preserved in solution of acetate of potash, possibly on account of chemical decompositions which occur. When these crystalline bodies are met with, as is usually the case, in non-albuminous urine, they could probably be best retained in an unaltered state by adding from twenty to thirty per cent. of solution of carbolic acid to the renal secretion in which they are found.

